



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,303	07/29/2003	Jun Zhao	A6311/T040320US	1876

7590 11/02/2004

Patent Counsel, M/S 2061  
APPLIED MATERIALS, INC.  
Legal Affairs Department  
P.O. Box 450A  
Santa Clara, CA 95052

EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/631,303

Applicant(s)

ZHAO ET AL.

Examiner

Karla Moore

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5, 7, 11-13, 15-23, 25, 27, 30-33, 35, 39-41, 43-51, 54-56 and 58-60 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,820,679 to Yokoyama et al.

3. With respect to claims 1, 21, 32 and 49, Yokoyama et al. disclose an apparatus for processing substrates in Figure 13, comprising: an atmospheric coating system (Figures 13 and 17; 205-3; column 22, rows 50-52); a first transfer chamber (center) disposed in said atmospheric coating system; a first substrate handling member (205-10 and 205-12) disposed in said first transfer chamber; a cure system (Figure 13, 201-202 and 209-210, also Figure 7) in communication with said first transfer chamber (through loop transporter Figure 13, 208); a second/cure system transfer chamber (209) disposed in said cure system; a second/cure system substrate handling member (column 25, rows 22-29) disposed in said second/cure system transfer chamber; a loadlock (210) in communication with said second/cure system transfer chamber; a cap system (Figure 13, 206; column 23, rows 41-44; also see Figure 17) in communication with said loadlock chamber; a third/cap system transfer chamber (center chamber) disposed in said cap system; and a third/cap system substrate handling system (inside center chamber) disposed in said third/cap system transfer chamber.

Examiner notes that all the chamber of the apparatus disclosed in Yokoyama et al. are in "communication" with one another via the numerous transferring mechanisms. Examiner also notes the the "cap" system and "cure" system described above and in Yokoyama et al. would be capable of the processes that they are named after. The courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the

claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

4. With respect to claims 2, 22, 33 and 50, the atmospheric coating system comprises: one or more coating modules (205-11) in communication with said transfer chamber; and one or more substrate bake modules (205-13, 205-14) in communication with said first transfer chamber.
5. With respect to claims 3, 23 and 51, the coating module may comprise a spin-on deposition module (column 22, rows 50-52).
6. With respect to claims 5 and 25, said cure system comprises one or more cure chambers (Figure 7, 104-4) in communication with said second transfer chamber.
7. With respect to claims 7, 27 and 35, said cure chamber comprises an electron beam radiation source (column 1, rows 49-51).
8. With respect to claims 11, 39 and 54, said cap system comprises: one or more processing chambers, each one of said processing chambers defining at least one isolated processing region therein, each processing region is connected with said third transfer chamber (see Figures 13 and 17).
9. With respect to claims 12, 40 and 55, a vacuum pump is in fluid communication with said one or more processing chambers (column 35, rows 56-60).
10. With respect to claims 13, 41 and 56, said processing region includes a gas distribution assembly disposed therein and each gas distribution assembly disposed therein and each gas distribution assembly receives process gases from one or more gas sources (column 22, rows 47-49 and column 23, rows 41-44).
11. With respect to claims 14, 42 and 57, each processing region comprises a plasma system having a RF generator connected with each processing region.
12. With respect to claims 15-16, 19-20, 30-31, 43-44, 47-48 and 58-60, while a substrate is being processed in said apparatus (the coat system, the cure system of the cap system), said apparatus is capable of keeping said substrate unexposed in an environment that is external to said apparatus, so as to prevent the exposure of said substrate to an environment external to said apparatus. As seen in the

Art Unit: 1763

Figures, a wafer does not need to leave the system to be processed in all areas of the apparatus described above.

13. With respect to claims 17-20, 45-46 and 48 and limitations that are drawn to specific processing conditions, the courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 4, 24 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama et al. as applied to claims 1-3, 5, 7, 11-13, 15-23, 25, 27, 30-33, 35, 39-41, 43-51, 54-56 and 58-60 above, in view of U.S. Patent No. 6,203,619 to McMillan.

17. Yokoyama et al. disclose the invention substantially as claimed and as described above.

18. However, Yokoyama et al. fail to teach one or more substrate cooling modules in communication with said first transfer chamber.

Art Unit: 1763

19. McMillan teaches the use of a cooling chamber in a multi chamber apparatus for the purpose of preparing a film for further processing or unloading (column 3, rows 30-32).
20. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a cooling chamber in communication with the first transfer chamber in order to prepare a film for further processing or unloading as taught by McMillan.
21. Claims 6, 8-10, 26, 28-29, 34, 36-38 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama et al. as applied to claims 1-3, 5, 7, 11-13, 15-23, 25, 27, 30-33, 35, 39-41, 43-51, 54-56 and 58-60 above, in view of U.S. Patent No. 4, 429,439 to Kobayashi et al.
22. Yokoyama discloses the invention substantially as claimed and as described above.
23. However, Yokoyama et al. fails to explicitly teach said cure chamber is in fluid communication with a vacuum pump, said cure chamber is in fluid communication with a gas distribution system configured to deliver process gases from one or more gas sources, said cure system further comprises a vacuum pump in fluid communication with said second/cure system transfer chamber or a vacuum pump is in fluid communication with said loadlock chamber.
24. Kobayashi et al. discloses a curing apparatus in Figure 6 comprising a curing chamber (11), a loading chamber (12) and a transfer chamber (13) all connected to vacuum pumps and the curing chamber also connected to a gas distribution system for the purpose of providing an apparatus effective in forming high precision patterns on a semiconductor wafer (column 6, rows 8-13 and 29-52).
25. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the curing apparatus and the transfer chamber and loading chamber connected that are connected to the curing chamber with a vacuum pump and also to have provided the curing chamber with a gas distribution system in Yokoyama et al. in order to provide an apparatus effective in forming high precision patterns on a semiconductor wafer as taught by Kobayashi et al.

Art Unit: 1763

26. Claims 14, 42 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama et al. as applied to claims 1-3, 5, 7, 11-13, 15-23, 25, 27, 30-33, 35, 39-41, 43-51, 54-56 and 58-60 above, in view of U.S. Patent No. 4, 264,393 to Gorin et al.
27. Yokoyama et al. discloses the invention substantially as claimed and as described above.
28. However, Yokoyama et al. does not disclose the specific type of plasma generation means used.
29. Gorin et al. teaches the use of a RF plasma generator for the purpose of forming a uniform, plasma (abstract).
30. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an RF generator as the plasma generation means in Yokoyama et al. in order to form a uniform plasma as taught by Gorin et al.

### ***Conclusion***

31. The *art* made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Publication No. 2003/0196597 A1 to Yamazaki et al. and Japanese Patent No. 2001185355 A to Yamazaki et al. disclose an atmospheric coating system communicating with vacuum processing systems through transfer chambers. Note: The Yamazaki references are not considered "prior" art based on publication dates and filing dates, but is cited it because it has similar subject matter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 571.272.1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1763

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



km  
1 November 2004

*P. Hassanzadeh*  
Parviz Hassanzadeh  
Primary Examiner  
Art Unit 1763